Reprogramming Somatic Cells into iPSCs Engineered with an Anti-PSCA CAR to Develop Allogeneic Off-the-Shelf Cell Therapy to Treat Pancreatic Cancer

Grant Award Details

Reprogramming Somatic Cells into iPSCs Engineered with an Anti-PSCA CAR to Develop Allogeneic Off-the-Shelf Cell Therapy to Treat Pancreatic Cancer

Grant Type: Quest - Discovery Stage Research Projects

Grant Number: DISC2-14190

Investigator:

Name:	Jianhua Yu
Institution:	City of Hope, Beckman Research Institute
Type:	PI

Award Value: $2,263,500

Status: Pre-Active

Grant Application Details

Application Title: Reprogramming Somatic Cells into iPSCs Engineered with an Anti-PSCA CAR to Develop Allogeneic Off-the-Shelf Cell Therapy to Treat Pancreatic Cancer

Public Abstract:

Research Objective

Our candidate product PSCA-CAR_s15 uiNK is derived from transduction of iPSCs selected from the most ideal source and episomally reprogrammed from mature NK cells or CD34+ cells.

Impact

Cell Functionality and Quality; Scale up and Manufacture

Major Proposed Activities

- Development and characterization of induced pluripotent stem cells (iPSCs) via somatic cell reprogramming of various human cells
- Selection of good iPSC candidate lines by testing NK cell differentiation potential of UCB-iPSCs, CD34-iPSCs, NK-iPSCs, and T-iPSCs
- Engineering the selected iPSC candidate(s) with deficiency of B2M, replacement of CIITA with HLA-E, and expression of PSCA-CAR_sIL-15
- Hematopoietic differentiation towards CD34+ cells and NK cells from the CAR u-iPSC cell line
- In vitro cytotoxicity of PSCA CAR NK cells, expansion, and freezing as an "off-the-shelf" product
- In vivo evaluation of iPSC-derived PSCA-CAR_s15 NK cells

Statement of Benefit to California:

Our goal is to develop an "off-the-shelf," ready-to-use cell therapy that is appropriate and easily accessible for any patient regardless of race, ethnicity, sex, gender, age, or socioeconomic status. By leveraging an effective, innovative, safe, and standardized off-the-shelf cell therapy to kill tumor cells and energize latent immune responses, we expect our results to have a positive impact by ultimately reducing mortality for patients suffering from devastating and deadly cancers.

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